Chapter 7: Habitat

Chapter Contents

7.1 Overview of Watershed Habitat

There are a limited number of high value habitat areas in the Mystic River Watershed, as measured by various state designations. These include:

Areas of Critical Environmental Concern (ACECs): Belle Isle Reservation in Winthrop is part of the Rumney Marshes ACEC.

Vernal Pools: Certified vernal pools are located in xx of the watershed's municipalities, including Reading (66), Medford (9), Lexington (6), Belmont (5), Woburn (5), and Melrose (3). Some of the pools listed in these towns may lie outside the watershed boundaries.

BioMap Core Habitats and Supporting Natural Landscapes: Areas around Spy Pond, Fresh Pond, and Horn Pond, and the Middlesex Fells have been designated core habitats and their supporting natural landscapes.

Great Ponds of Massachusetts: Spy Pond in Arlington, Little Pond in Belmont, Upper and Lower Mystic Lakes, Ell Pond in Melrose, Mystic, Wedge and Winter Ponds (all in Winchester), and Horn Pond in Woburn are all designated as Great Ponds.

There are no "Living Waters" Core Habitats identified by the Natural Heritage & Endangered Species Program in the Mystic River watershed.

With the exception of Belle Isle Marsh, all of the high value habitats are located in the upper portion of the watershed, as might be expected from the land use information presented in Chapter 5.

While there are only a few large-acreage high value habitats, there are numerous smaller areas that provide valuable urban wilds and should be targeted for protection. For example, studies of Alewife Reservation have found substantial wildlife value, which suggests the need to provide greater protection for some smaller areas in the watershed. Many such sites identified as priorities for protection in the open space inventories described in Chapter 5.

7.2 Aquatic Life

Anadromous Fish

The Mystic River and Alewife Brook have a significant annual herring run, which includes alewife and blueback herring. Variations in the numbers of herring running

have been observed, including no observations of herring in Winn Brook (in the Alewife Brook subbasin) in 2004 and a lower-than-normal run in the Mystic River.

The operation of the Amelia Earhart dam has a significant impact on the ability of herring to migrate up the Mystic during spawning season. In past years, the MDC operator of the dam, the state Division of Marine Fisheries and the watershed association developed a protocol to allow for fish passage through the dam, which does not have a fish ladder. The protocol involved operating the gates to let fish into and through the locks during low tides, and continued during the spawning season until the amount of boat traffic was sufficient to allow large numbers of fish through without separate openings specifically for fish passage. This understanding should be reviewed periodically, to assess whether the protocol is being followed and whether it appears to be effective.

Herring are not able to get past the Mystic Lakes dam that divides Upper and Lower Mystic Lakes. This dam is in poor repair, which is of concern for dam safety and flooding reasons as well as for fish passage. Past proposals to install a fish ladder were rejected because the dam could not bear the weight in its current condition. The DCR is now developing a plan for restoring the dam, which is expected to include providing for fish passage into Upper Mystic Lake.

Observers have noted a steady decline of the alewife herring population in the Alewife Brook subbasin, with no alewife observed in the 2004 season. A variety of hypotheses have been suggested for the decline in populations, including low flow and shallow conditions in Alewife Brook, Little River, and Perch Pond; low DO levels; chemical pollution (e.g., from treatment of Spy Pond); operation of the Amelia Earhart Dam; or even region-wide declines in alewife runs. (See discussion on the Friends of Alewife Reservation's website, http://www.friendsofalewifereservation.org/homepage.htm.) More work is needed to determine the extent and causes of reduced alewife populations.

The Massachusetts Division of Marine Fisheries has been conducting surveys of anadromous fish passage in coastal Massachusetts, which will provide insight into the state of the herring run. The report for the Boston Harbor region was not available in time to be considered in this assessment.

Inland Fisheries

The Department of Fish and Wildlife conducts fish population sampling to 1) assess their current status, and 2) determine a process for restoration. Determining strategies for restoration includes identifying target fish communities, habitat mapping, and developing an index of "biotic integrity." The DFW must first define a fish community appropriate for a natural river in southern New England, defined by the mix of 3 categories of fish: fluvial specialists – those that require flowing water – such as brook trout; fluvial dependents – species that require flowing water at some time, as during reproduction – such as white suckers; and generalist/pond fishes – species that do not require flowing water, such as bluegill and crappie. So far, DFW has been examining rivers in a *desirable fishery state*, i.e., quality rivers, and incorporating input from regional biologists other relevant data to verify their determination. From this analysis, the DFW

estimates that rivers in a desirable fishery state will exhibit ratios of 50% fluvial specialists, 25% fluvial dependents, and 25% generalists. DFW will also determine the habitat available, through habitat mapping, for the different types of fish communities and use the index of biological integrity to set measurable goals for restoration of specific waterbodies.

The DFW's maps for major ponds in the watershed provide the following (unfortunately dated) information on fish populations:

- Horn Pond is a heavily fished trout pond, and is stocked with thousands of trout each year. The pond also supports good bass fishing. A survey conducted in the summer of 1982 found 13 species, with yellow perch dominating by a wide margin.

- Spy Pond was last surveyed in 1980, when 10 species were recorded. The pond is not heavily fished, and contains numerous largemouth bass and perch. The pond has been regularly stocked with tiger muskie fingerlings for more than a decade.

- Upper Mystic Lake was last surveyed in 1981. Fourteen species were recorded, including largemouth bass and pickerel.

DFW has not yet collected data on freshwater fish in the Mystic River watershed, except for these surveys in the 1980s in Spot and Spy Ponds and Upper Mystic Lakes. The DFW expects to begin sampling at approximately 14 sites in the watershed the near future, however.

7.3 Invasive Plants

Invasive plants are a significant problem throughout the watershed. These plants out-compete native vegetation and provide less attractive habitat for wildlife. While no comprehensive inventory exists, there have been a number of shoreline surveys completed for Mystic waterbodies that have documented extensive intrusion of invasive plants.[1] For example:

- The Alewife Brook/Little River shoreline survey found extensive Japanese Knotweed and Phragmites. The Japanese Knotweed presented a particular problem in some shoreline sections because they blocked access to the shore and hindered native species.

- Phragmites and Knotweed were also widespread in the 1997 survey of the Mystic River and the Malden River. Invasives dominated on the Malden River, also including Purple Loosestrife.

[1] Shoreline surveys were conducted with assistance and training from the Massachusetts Riverways program on the Mystic and Malden Rivers (1997), Alewife Brook (1997 and 2000), the Aberjona River (2001), and Belle Isle Marsh (2002).

- The Aberjona shoreline survey in 2001 found Phragmites, Purple Loosestrife, Japanese Knotweed, and Oriental Bittersweet throughout the study area

Local groups have been working to remove invasive plants in several watershed locations. For example, the Friends of the Mystic River have been removing Japanese Knotweed along the banks of the Mystic River in Medford for several years. Roger Frymire has been removing water chestnuts in the Alewife Subbasin, and has virtually eliminated the plants using hand-pulling methods along Alewife Brook and Little Pond and achieved significant reductions at Blair, Yates and Spy Ponds.

Ideally, invasives control should involve a regional strategy. The success of local efforts can be undone by recolonization from adjacent areas, and careless harvesting – including discarding harvested invasives in the waters – may simply transport the problems downstream.

7.3 Habitat Restoration

There are several efforts underway in the watershed to restore habitat:

- The Department of Conservation and Recreation's Master Plans for Blair Pond (December 1999) and Alewife Reservation (2003) include restored aquatic and wildlife habitat areas, as well as paths, seating, and interpretive elements to support human use of the parklands. Implementing these plans should be a high priority for the watershed. In addition, developing the long-delayed Master Plan for the Mystic River Reservation is also a high priority, to achieve important open space, recreational and habitat goals.

- The Army Corps of Engineers has completed and assessment of the Malden River, and is preparing a habitat restoration plan for the river.

- As redevelopment of industrial and commercial sites occurs in various locations, there are opportunities to restore habitat. For example, a group of local advocates is investigating the potential to restore wetlands on the Discovery Park property in North Cambridge.

7.4 Priorities for Action

Efforts to improve water quality and to preserve open space are directly related to preserving habitat for fish and other wildlife. These priorities were discussed in Chapters 4 and 5, respectively.

The following are additional priorities related to habitat:

- Determine and address the causes of reduced herring runs in the Mystic River and Alewife Brook. The evaluation should consider the results of the DMF's surveys, the operation of the Amelia Earhart dam, and new herring counts conducted by volunteers with guidance from the DMF.

- Conduct inland fish surveys, assess the results, and establish priorities and strategies for restoring degraded habitat.

- Conduct a watershed-wide inventory of invasive plants along Mystic waterbodies, and develop a strategy for regional efforts to reduce or eliminate invasives.

- Implement the DCR's Master Plans for Blair Pond and Alewife Reservation, and develop a Master Plan for the Mystic River.

- Implement restoration of habitat along the Malden River, based on the results of the Army Corps of Engineers investigations.